AMENDMENTS TO THE SPECIFICATION

Please amend paragraph [0005] beginning on page 2, as follows:

[0005]   Various mechanisms have been disclosed for occupant sensing. Breed et al. in U.S. Pat. No. 5,845,000, issued Dec. 1, 1998, ~~describe~~ describes a system to identify, locate, and monitor occupants in the passenger compartment of a motor vehicle. The system uses electromagnetic sensors to detect and image vehicle occupants. Breed et al. suggest that a trainable pattern recognition technology be used to process the image data to classify the occupants of a vehicle and make decisions as to the deployment of air bags. Breed et al. ~~describe~~ describes training the pattern recognition system with over one thousand experiments before the system is sufficiently trained to recognize various vehicle occupant states. The system also appears to rely solely upon recognition of static patterns. Such a system, even after training, may be subject to the confusions that can occur between certain occupant types and positions because the richness of the occupant representation is limited. It may produce ambiguous results, for example, when the occupant moves his hand toward the instrument panel.

Please amend paragraph [0006] beginning on page 2, as follows:

[0006]   A sensor fusion approach for vehicle occupancy is disclosed by Corrado, et al. in U.S. Pat. No. 6,026,340, issued Feb. 15, 2000. In Corrado, et al., data from various sensors is combined in a microprocessor to produce a vehicle occupancy state output. Corrado, et al. discloses an embodiment where passive thermal signature data and active acoustic distance data are combined and processed to determine various vehicle occupancy states and to determine whether an air bag should be deployed. The system disclosed by Corrado, et al. detects and processes motion data as part of its sensor processing, thus providing additional data upon which air bag deployment decisions can be based. However, Corrado, et al. discloses multiple sensors to capture the entire passenger volume for the collection of vehicle occupancy data, increasing the complexity and decreasing the reliability of the system. Also, the resolution of the sensors at infrared

and ultrasonic frequencies is limited, which increases the possibility that the system may incorrectly detect an occupancy state or require additional time to make an air bag deployment decision.

Please amend paragraph [0007] beginning on page 3, as follows:

[0007]   Another sensor fusion approach for vehicle occupancy is disclosed by Owechko, et al., in U.S. Patent Application Publication No. US 2003/0204384, which is incorporated herein by reference. In Owechko, et al., three different features, including a disparity map, a wavelet transform, and an edge detection and density map, are extracted from images captured by image sensors. Each of these three features is individually processed by respective classification algorithms to produce class confidences for various occupant types. The occupant class confidences are fused and processed to determine occupant type. A problem is that each of the three classification algorithms produces its class confidences based on only its respective feature. Since each classification algorithm has the benefit of only information associated with its respective feature, and does not have the benefit of information associated with the other two of the three features, the accuracy of the class confidences produced by the classification algorithms may not be as accurate as they could possibly be.

Please amend paragraph [0042] beginning on page 10, as follows:

[0042]   A block diagram depicting the components of a computer system used in the present invention is provided in FIG. 1. The data processing system 100 comprises an input 102 for receiving information from at least one sensor for use in classifying objects in an area. Note that the input 102 may include multiple "ports". Typically, input is received from sensors embedded in the area surrounding an operator such as CMOS and CCD vision sensors. The An output 104 is connected with the a processor 106 for providing information regarding the object(s) to other systems in order to augment their actions to take into account the nature of the object (e.g., to vary the response of an airbag

deployment system based on the type of occupant). Output <u>104</u> may also be provided to other devices or other programs, e.g. to other software modules, for use therein. The input 102 and the output 104 are both coupled with a <u>the</u> processor 106, which may be a general-purpose computer processor or a specialized processor designed specifically for use with the present invention. The processor 106 is coupled with a memory 108 to permit storage of data and software to be manipulated by commands to the processor.

Please amend paragraph [0051] beginning on page 14, as follows:

[0051]   Next, the feature data 308, 310, and 312 are provided to classifier modules and tracking modules 314, 316, and 318. In the embodiment as shown in FIG. 3, three classifier modules are used. All three of the classifier modules produce classification values for rear-facing infant seat (RFIS), front-facing infant seat (FFIS), adult in normal or twisted position (ANT), adult out-of-position (AOOP), child in normal or twisted position (CNT), child out-of-position (COOP),and empty; each of classifiers 314, 316, 318 processing the disparity data 308 from the Disparity Map module 302, the scale data 310 from the Wavelet Transform module 304, and the edge density map data 312 from the Edge Detection and Density Map module 306. All of the classifiers have low computational complexity and have high update rates. The details of the feature extraction modules <u>302,304,306</u> and the classifiers <u>314,316,318</u> are described below.

Please amend paragraph [0053] beginning on page 15, as follows:

[0053]   A flow chart depicting the general steps involved in the method of the present invention is shown in FIG. 4. After the start of the method 400, a step of receiving images 402 is performed in which a series of images is input into hardware operating the present invention. Next, various features, including features such as those derived from a disparity map, a wavelet transform, and via edge detection and density are extracted <u>in step</u> 404. Once the features have been extracted, the features are classified <u>in</u>

step 406 and the resulting classifications are then processed to produce an object estimate in step 408. These steps may also be interpreted as means or modules of the apparatus of the present invention, and are discussed in more detail below.

Please amend paragraph [0063] beginning on page 18, as follows:

[0063] Operation 506 in FIG. 5 represents the masking of the edge map with the mask image to identify the important edge pixels from the input image. Block 508 represents the creation of the residual edge map. The residual edge map is obtained by subtracting unimportant edges (i.e., edges that appear in areas where there is little or no activity as far as the occupant is concerned).

Please amend paragraph [0065] beginning on page 19, as follows:

[0065] ~~Block~~ In FIG. 5, block 512 represents the extraction of features (e.g., 96 for a 12x8 array) from the coarse pixel array. The edge densities of each cell in the edge density map are stacked as features. The features are provided by a feature vector formed from the normalized strength of edge density in each cell of the coarse cell array. The feature vector is then used by classification algorithms (such as the FBNN, C5, NDA and FAN algorithms discussed below) to classify the occupant into RFIS, FFIS, Adult in normal position, Adult out-of-position, Child in normal position, or Child out-of-position. Block 514 represents the iteration of the algorithm for additional images according to the update rate in use.